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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Geometrical product specifications (GPS) - X-ray three
dimensional size measuring machines - Part 4: Evaluation of
uncertainty in measurement**

产品几何技术规范（GPS）X射线三维尺寸测量机 第4部分：测量不确定度评定

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 4 of GB/T 34874 "Technical Specification for Product Geometry (GPS) X-ray Three-Dimensional Dimension Measuring Machine".

GB/T 34874 has published the following parts.

- Part 1: Vocabulary;
- Part 3: Acceptance testing and retesting;
- Part 4: Evaluation of measurement uncertainty;
- Part 6: Detection methods for workpieces.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document is proposed and coordinated by the National Technical Committee for Standardization of Product Geometry Technical Specifications (SAC/TC240).

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Introduction

X-ray 3D dimension measuring machine is a kind of geometric measurement equipment with common application and leading technology.

As an integral part of the measurement results, the accuracy of the measurement results has a significant impact.

The measurement uncertainty evaluation method of X-ray three-dimensional dimension measuring machine is developed to ensure the accuracy of the measurement results.

The formulation of this document will also help to further improve the standard system of X-ray 3D dimension measuring machines and fill the gap in China's X-ray 3D dimension measuring machines.

It can not only promote the application of X-ray 3D dimension measuring machines by various manufacturers, but also fill the gap in the application standards of dimension measuring machines.

Unification improves the performance consistency and stability of factory equipment, and provides a solid technical foundation for the wide application of X-ray 3D dimension measuring machines.

Technical support and guarantee.

For the convenience of readers, GB/T 34874 is divided into 6 parts. The contents of these parts are interrelated and independent, and together constitute The application method of X-ray three-dimensional dimension measuring system is specified, and the relevant contents of X-ray three-dimensional dimension measuring machine are specified in detail.

GB/T 34874 is intended to consist of 6 parts.

- Part 1: Vocabulary. Aims to define the terms used in X-ray three-dimensional dimension measuring machines.
- Part 2: General technical requirements and applications. Aims to specify the basic operating requirements and applications of X-ray three-dimensional dimension measuring machines scene.
- Part 3: Acceptance test and retest. Aims to specify the inspection criteria and retest execution methods of equipment.

- Part 4: Evaluation of measurement uncertainty. Aims to provide a method for evaluating the measurement uncertainty of X-ray three-dimensional dimension measuring machines.
- Part 5: Extraction and fitting of feature elements. Aims to specify the feature extraction and data fitting methods in image processing.
- Part 6: Workpiece detection method. Aims to specify the specific operation method of the equipment in workpiece measurement.

Product Geometric Specification (GPS) X-ray 3D dimension measuring machine Part 4:
Evaluation of measurement uncertainty

1 Scope

This document describes a method for evaluating the measurement uncertainty of X-ray 3D dimension measuring machines.

This document is applicable to the measurement uncertainty assessment of X-ray three-dimensional dimension measuring machines.

2 Normative references

GB/T 18779.2

GB/T 27418

GB/T 27419

GB/T 34874.1

JJF1001

3 Terms and definitions

The terms and definitions defined in GB/T 18779.2, GB/T 27418, GB/T 27419, GB/T 34874.1 and JJF1001 apply to this document.

4.1 Scope of measurement tasks

As a non-destructive testing technology equipment, X-ray 3D dimension measuring machine has a wide range of measurement tasks, including but not limited to the following aspects.

- Internal structure measurement. It can penetrate the object being tested and has high spatial resolution to obtain its internal structure, shape and size.

And other information, suitable for the detection of various complex structures;

- External structure measurement. With high spatial resolution, it can obtain information